

## **REMARKS**

### **Summary of the Office Action**

Claims 2, 5 and 6 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite.

Claims 2 and 5 are rejected under 35 U.S.C. § 102(b) as being anticipated by International Patent Publication No. WO 91/08180 ("Wakselman").

Claims 2 and 5 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Wakselman in view of Japanese Patent Document No. JP 4-55333 ("Sato").

Claims 2 and 5 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Application Publication No. 2002/0172317 to Maksimchuk et al. ("Maksimchuk") in view of U.S. Patent No. 4,093,886 to Blackwell ("Blackwell").

Claim 6 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Maksimchuk in view of Blackwell and U.S. Patent No. 6,130,926 to Amini ("Amini").

### **Summary of the Response to the Office Action**

Applicants have amended claim 2.

Claims 1-6 are pending, of which claims 1, 3 and 4 are withdrawn from consideration.

### **Response to the Office Action**

Applicants thank the Examiner for courtesies extended during a telephone interview conducted on November 15, 2007 between Applicants' below signed representative and the

Examiner. The Examiner issued an Interview Summary on November 20, 2007. The following comments include arguments presented in the interview.

Claims 2, 5 and 6 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Applicants respectfully traverse the rejection. At page 2, the Office Action describes that “[t]he term porous is not defined in a quantitative sense by the claim. . .” Applicants have amended claim 2 to address the Examiner’s concern. In particular, claim 2 now recites “a porous base film having a porosity of 70% or more.” Support for claim 2 is provided at, for example, paragraphs 0039 and 0047 of Applicants’ specification as originally filed. Applicants respectfully request that the rejection under 35 U.S.C. § 112, second paragraph, be withdrawn. In this regard, Applicants’ below signed representative conducted a second telephone interview with the Examiner on November 28, 2007. In the interview, Applicants submitted that the recited “porosity” is based on a volume measurement. In support of Applicants’ assertion, Applicants presented definitions included in the “McGraw-Hill Dictionary of SCIENTIFIC and TECHNICAL TERMS,” Sixth Edition, and Webster’s Third New International Dictionary. (See Exhibits A and B, respectively, to the instant Response.) During the interview, the Examiner agreed that Applicants’ specification supports that porosity is based on a volume measurement.

Claims 2 and 5 are rejected under 35 U.S.C. § 102(b) as being anticipated by Wakselman. Claims 2 and 5 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Wakselman in view of Sato. Applicants respectfully traverse the rejection under 35 U.S.C. § 102(b) and the rejection under 35 U.S.C. § 103(a).

Applicants invention is directed to a deuteron generating target including a porous base film and a deuterated organic compound. The base film has a porous structure for holding the

deuterated organic compound therein, and the porosity of the base film is 70% or more. In other words, the base film functions as a holder of the deuterated organic compound. Furthermore, the base film is comprised of a halogen-containing organic compound, in order to solve the problem of the prior art – i.e. that the nucleus of hydrogen (i.e. proton), which is lighter in weight than the nucleus of deuterium (i.e. deuteron), is emitted forward, which makes it difficult to emit deuterons efficiently when a high-intensity laser beam is irradiated to the target. (See, for example, paragraph 0006 of Applicants' specification). The halogen-containing organic compound is an organic compound in which hydrogen is substituted by halogen, and therefore deuterons can be emitted efficiently. That is, Applicants' invention is characterized by, as a structural feature a porous structure of the base film for holding the deuterated organic compound and by, as a material feature, a combination of the halogen-containing organic compound and the deuterated organic compound for efficiently emitting deuterons.

Turning to Wakselman, Applicants respectfully submit that the English abstract of Wakselman simply discloses deuterized 2,3,3-trihalogeno 2-fluoro 1-propanols (hereinafter “first materials”). These first materials can be prepared by means of a reaction mechanism that is so-called “radical condensation of deuterized methanol” on a tetrahalogenoethylene (second material). The first material can be used to prepare deuterized fluoro-2 acrylic acid halides (third material), which are useful for manufacturing optical fibers. Applicants respectfully submit that the abstract does not show a tetrahalogenoethylene as a material of a base film and a deuterized methanol as a material to be impregnated in a tetrahalogenoethylene. Thus, Applicants respectfully submit that Wakselman does not disclose the features of “a porous base film having a porosity of 70% or more, said porous base film being mainly composed of halogen-containing

organic compound” and “a deuterated organic compound impregnated in at least part of said porous base film,” as recited in claim 2.

Applicants submit that Sato discloses a fiber preform having a porous glass layer. However, the layer is comprised of glass material, and therefore it should be distinguished from Applicants’ film material. Moreover, the porous structure of the fiber preform will dissolve by sintering the preform. Even assuming that Wakselman teaches a base film (an assumption with which Applicants disagree), the base film employed with Sato’s porous glass structure has a different structure from Applicants’ porous base film because Sato’s porous glass structure will dissolve during sintering. Thus, Applicants respectfully submit that a combination of Wakselman and Sato still would not disclose the features of “a porous base film having a porosity of 70% or more, said porous base film being mainly composed of halogen-containing organic compound,” as recited in claim 2.

Claim 5 depends from claim 2, and recites the same combination of allowable features recited in claim 2, as well as additional features that define over the prior art. Accordingly, it is requested that the rejection under 35 U.S.C. § 102(b), of claim 2 and 5, and the rejection under 35 U.S.C. § 103(a), of claim 2 and 5, be withdrawn.

Claims 2 and 5 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Maksimchuk in view of Blackwell. Claim 6 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Maksimchuk in view of Blackwell and Amini. Applicants respectfully traverse the rejections under 35 U.S.C. § 103(a).

At page 7 the Office Action asserts that Maksimchuk discloses a deuterated organic compound 18 (i.e. deuterated plastic layer) is impregnated in at least a part of porous base film

16. In this regard, the Office Action asserts that “impregnated at least results from the use of said target through high-intensity laser irradiation and consequent heating resulting in thermal diffusion, the target being used many times, in particular in pulsed mode.”

Applicants respectfully submit that in accordance with “McGraw-Hill Dictionary of SCIENTIFIC and TECHNICAL TERMS,” Sixth Edition, the technical term “impregnate” means “to force a liquid substance into the spaces of a porous solid.” (See exhibit C to the instant Response.) Applicants submit that it is clear that the claimed wording “impregnate” does not include “thermal diffusion from solid plastic layer 18.” Applicants also note that the elements of Maksimchuk to be thermally diffused do not exist in the Mylar film before laser radiation.

Moreover, when the high-intensity laser beam is irradiated to the deuteron generating target, a hole is opened at the irradiation area of the high-intensity laser beams in the deuteron generating target, so that the same irradiated area cannot be reused. In other words, even though laser irradiation causes thermal diffusion from the plastic layer 18, the irradiated area of the target after laser irradiation cannot be reused.

Applicants’ invention achieves an efficient deuteron emission by the combination of the organic compound base, in which hydrogen is substituted by halogen, and the deuterated organic compound that is impregnated in the porous base film without relation to before or after laser irradiation.

Thus, Applicants respectfully submit that Maksimchuk does not disclose at least the features of “a deuterated organic compound impregnated in at least part of said porous base film,” as recited in claim 2, and that Blackwell fails to overcome the deficiencies of Maksimchuk. Claim 5 depends from claim 2, and recites the same combination of allowable

features recited in claim 2, as well as additional features that define over the prior art.

Accordingly, it is requested that the rejection under 35 U.S.C. § 103(a), of claim 2 and 5, be withdrawn.

Claim 6 depends from claim 2, and recites the same combination of allowable features recited in claim 2, as well as additional features that define over the prior art. Applicants respectfully submit that Amini fails to overcome the deficiencies of Maksimchuk and Blackwell. Accordingly, it is requested that the rejection under 35 U.S.C. § 103(a), of claim 6, be withdrawn, and the claims allowed.

**CONCLUSION**

In view of the foregoing, Applicants submit that the pending claims are in condition for allowance, and respectfully request reconsideration and timely allowance of the pending claims. Should the Examiner feel that there are any issues outstanding after consideration of this response, the Examiner is invited to contact Applicants' undersigned representative to expedite prosecution. A favorable action is awaited.

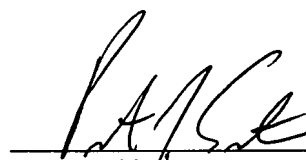
**EXCEPT** for issue fees payable under 37 C.F.R. § 1.18, the Commissioner is hereby authorized by this paper to charge any additional fees during the entire pendency of this application including fees due under 37 C.F.R. § 1.16 and 1.17 which may be required, including any required extension of time fees, or credit any overpayment to Deposit Account No. 50-0573. This paragraph is intended to be a **CONSTRUCTIVE PETITION FOR EXTENSION OF TIME** in accordance with 37 C.F.R. § 1.136(a)(3).

Respectfully submitted,

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Dated: November 30, 2007

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